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BRIEF COMMUNICATION

A NEW SUBSPECIES OF THE SEA URCHIN *PERONELLA LESUEURI* FROM THE QUATERNARY OF SOUTH AUSTRALIA

The laganid sea urchin, *Peronella lesueuri*, currently lives in the seas from the Maldives to New Zealand and north to Hong Kong. On the Australian coastline it occurs from Albany in Western Australia, north around the tropical coast to Port Denison (Bowen, Queensland) in the east[1]. It is known from the Miocene of Java and occurs in several places from the Pliocene in the Indo-Australian area.[2] It has not been recorded previously, extant or fossil, in South Australia.

Over the past few years, excavations for foundations and site works for the new Northern Power Station at Port Augusta have resulted in a variety of Quaternary fossils being brought to the South Australian Museum for identification. Amongst them have been a number of large sand dollar sea urchins, which have been acquired from several sources, most notably Messrs John Turner and Des Page.

These echinoids were derived from a creamy yellow-grey silty clay dredged during excavation of the large cooling water channel " . . . from a depth of about 7-8m in yellowish mud, below a black mud, and above a clean sand and hard, brown clay. The bottom of the channel is limestone at about 14m".[3] To determine more accurately the stratigraphic position of the echinoids, access was gained to the study reports[4] on the geology of the new power station site and to the core held in the S.A. Dept Mines and Energy Core Library.

The sequence can be matched in some of the bores drilled, though not all because of rather rapid lateral changes concommitant with its nearshore estuarine setting. The matrix matches those segments of the bore-cores interpreted as Bakara Calcrete although no direct evidence of echinoid remains was present. It is probably equivalent to the "soft mottled sandy clay"[5] just below the Glanville Formation.

Shells of the Sydney blood cockle *Anadara trapezia* occur in the sand dredged with the echinoids. Unfortunately they are not found together in the same lump of matrix and their true relationship has been obscured by excavation. *A. trapezia* is abundant in the Glanville Formation elsewhere, equivalent of the Bakara Calcrete.[6] The age of the echinoids is therefore considered to be Late Pleistocene, possibly of the last Pleistocene high sea level.

Nine mostly complete specimens and numerous segments have been collected (Table 1).

SYSTEMATICS
Class Echinoidea
Order Clypeasteroidea A. Agassiz
Family Laganidae A. Agassiz

Genus *Peronella* Gray
Peronella lesueuri (L. Agassiz, 1841)
Peronella lesueuri augusta subsp. nov.

Laganum lesueuri L. Agassiz, 1841: 116, pl. 24, figs 3–6[7]
Peronella lesueuri A. Agassiz, 1872: 148.[8]

Holotype: P24854, South Australian Museum, comprising a complete test.

Diagnosis: Medium to large size, thin, elongate, oval; broadest just anterior of the apical disc, tapered behind, orally slightly concave. Notched or tangentially flattened at marginal ends of ambulacra. Apical area raised, almost central; petals narrow elongate, open, length 0.5–0.7 of radius, petals reduced to single pores apically and end some distance from the genital pores, between paired pores miliary tubercules only; four genital pores all within the madreporite, the posterior two placed wider apart. Peristome anterior of centre; ambulacral food gooves short, with the anterior groove 10% of length on the holotype. Periproct 6% of length from posterior margin. Tubular ornamentation fine, regular, twice as dense dorsally as ventrally.

Comment: Morphologically, *Peronella lesueuri* appears to be quite variable and although two varieties have been described[1] the species is clearly in need of revision. The specimens described here differ consistently from *P. lesueuri lesueuri* in that they are concave orally, tapered behind, have a test margin that borders on the thin extreme, and the petals reduce to single pores apically.

These specimens differ from *P. lesueuri* var. *rostrata*, extant in the Philippines, in that they are broader relative to length, the tapering of the test posteriorly does not reach the extremes of this variety, nor do the series of pore pairs reach the genital pores and the genital pores are within the madreporite rather than on the margin.

TABLE 1. *Measurements of* Peronella lesueuri augusta *subsp. nov.* N, *collection number, South Australian Museum;* L, *longitudinal diameter;* T, *transverse diameter;* H, *height. All measurements in millimetres.*

N	L	T	H
P24854 (type)	80.0	70.9	11.2
P24852	68.5	58.1	9.0
P24562	85.1	75.5	11.3 (est)
P24659	79.4	72.2	11.7
P24664	39.6	35.7 (est)	
P24850	51.8	45.7	9.8
P24851	40.3	37.6	5.5
P24853	86.2	78.1	11.8
P24855	71.3	60.5	7.2

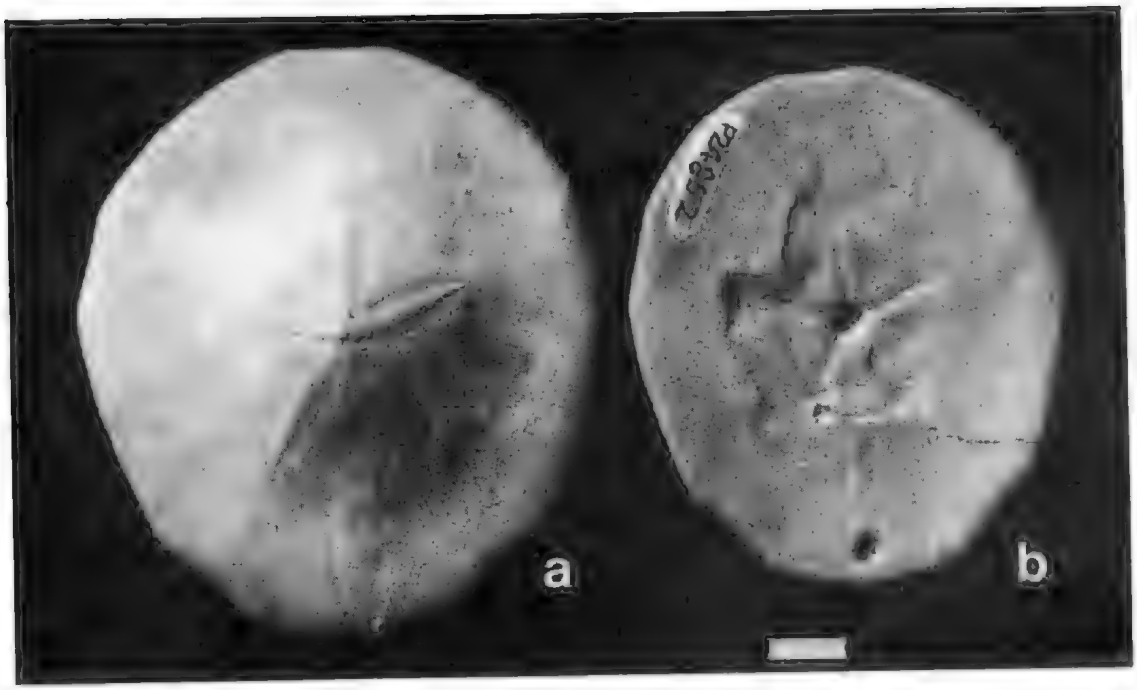

Fig. 1. *Peronella lesueuri augusta* subsp. nov. (a) apical view SAM P24854, (b) adapical view SAM P24852, Scale = 1cm.

The specimens differ from *P. lesueuri* var *gadiana*, extant in Singapore and the Strait of Malacca, in that the shape of the test is elongate rather than rounded, the margin being thin, the shape of the pore pairs and that they are separated only by miliary tubercules rather than interrupted by primary tubercules.

[1] **Mortensen, T.H.** (1948) "A Monograph of the Echinoidea." Part IV(2), Clypeastroida. (Reitzel, London.)
[2] **Durham, J.W.** (1955) Univ. Calif. Public. Geol. Sci., **31**, 73–198.
[3] **Turner, J.** (1984) Pers. comm. 21.vi.1984.
[4] **Selby, J., Waterhouse, J.D. & Jones, G.** (1976) Proposed Northern Power Station, Playford South site, Port Augusta. Preliminary geological and botanical investigations. Unpub. Report. S. Aust. Dept Mines. Rept. Bk. 76/69.
[5] **Selby, J. & Milner, G.** (1981) Q. Geol. Notes, Geol. Surv. S. Aust. **77**, 1–7.
[6] **Firman, J.** (1969) Quaternary Period. *In* Parkin, L.W. (ed. "Handbook of South Australian Geology." (Geol. Surv. S. Aust., Adelaide.)
[7] **Agassiz, L.** (1841) "Monographies d'echinodermes: des Scutelles." (Neuchatel en Suisse.)
[8] **Agassiz, A.** (1872) "Illustrated Catalogue of the Museum of Comparative Zoology at Harvard College, No. 7. Revision of the Echini." (Univ. Press, Cambridge.)

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